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The viewpoints of primary education pre-service science teachers about the environment according to anthropocentric and non-anthropocentric approaches

Elif Omca Çobanoğlu[a,*], Çiğdem Karakaya[b]

[a,b] *Ondokuz Mayıs University, Faculty of Education, Samsun, Turkey*

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Abstract[*]

This study seeks an answer to the questions "What are the viewpoints of primary education pre-service science teachers about the environment; are these viewpoints differentiated according to certain variants?" At a university in the Black Sea Region of Turkey, an attempt was made to determine the viewpoints of pre-service science teachers at different levels about the environment by means of a 5 point Likert scale consisting of 24 items and holding the reliability coefficient of .85 (Cronbach α). In the analysis of the results obtained by using the SPSS 13.0 package, it was realized that pre-service teachers' viewpoints were close to approaches which were non-anthropocentric and that they differed considerably according to class level, their fathers' job and the kind of the high school they graduated from. Certain practices, which are devoted to pre-service teachers' developing positive viewpoints about the environment and transferring these to their students in the future, should be applied.

Keywords: Environmental Ethic values; anthropocentric approaches; non-anthropocentric approaches; pre-service teachers.

1. 1. Introduction

Everything except for the individual: the definition of environment in social sciences. It includes natural, artificial and social environments. The borders of the environment are flexible; therefore, it covers not only the room, house, region, country and evens the whole world the individual lives in, but also social relations at certain levels such as personal traits, family relations, neighborhood (Yıldız et al., 2000, p.14). The environment of a person is defined as the surroundings in which he maintains all his social, biological and chemical activities. (Özkaya et al., 2006, p.4).

Mankind's depredation and ruthless exploitation of nature, for his own ends and benefit, is the chief cause of many of the environmental problems we encounter (Erten, 2005). Environmental pollution gradually increases through a fast rising world population, unplanned industrialization and poor urbanization, nuclear trials, regional

[*] E. Omca Çobanoğlu
E-mail address: eomca@omu.edu.tr

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wars, pesticides used to increase productivity, and chemical substances such as artificial fertilizers and detergents. As a result of this, the high pollution levels in air, water and soil have now the point where they can be detrimental for living beings (Çevre Bakanlığı, 1998, p. 60; Çabuk & Karacaoğlu, 2003). It is thought that the environment, which is so crucial for living beings, is being destroyed owing to many reasons, human practices being the primary cause, and that we are moving away from having a habitable environment. The environmental problems arising from the interaction between the human-being and the environment are factors that destroy the natural balance and the expansion and continuance of the industrial revolution, which began principally in Europe, accelerates this deformation. (Bozyiğit et al., 1998, p.3)

Since environmental problems are increasingly noted, certain precautionary and protective laws are passed, and some technological practices are conducted to help solve the problems. As environmental problems were noticed only very late, in spite of many warnings, it is now thought that these problems cannot be solved by technology and laws alone, they can be resolved merely through the alteration of individual behaviors (Erten, 2005). Accordingly, viewpoints on the environment and even human being-environment relations have become more of an issue.

Approaches that investigate human being-environment relations can be considered in a new discipline of ethical philosophy that is called environmental ethics. Two of these approaches have mechanical and ecological dimensions; the mechanical dimension covers anthropocentric and societal approaches, and reaches the conclusion that nature is a means to benefit people (Ünder, 1996, p.60). The ecological dimension which is emerging as an alternative to this view includes life and environment centered approaches, and reaches the conclusion that variety should be maintained in nature and that the systems should be placed to center, not human or another living being. (Ünder, 1996, pp.79–83). In fact, human being-environment relations can be broadly categorized as anthropocentric, that is human centered, and as non-anthropocentric, that isn't human centered.

Anthropocentric approaches are values which adopt organizing social life and save people health (Merchant, 1992, pp.70-74). Non-anthropocentric approaches (one of them is ecocentrism) are values which adopt people as a part of ecosystems and save ecosystems' health (O'Riordan, 1995; Merchant, 1992, pp.74-80). While the anthropocentric approach places the human at the center of the ethical universe, non-anthropocentric approaches take radically different positions. All living beings, and in some theories, even lifeless things such as mountains and stones appear in the center. This is the ethical view of the non-anthropocentric approach (Thompson, 1998).

Personal benefits (self interest and laissez faire') and mutual coercion are crucial to anthropocentric approaches, and this approach claims that the ruler of nature is a human being and that people can benefit from nature as long as it provides advantages for people. Anthropocentric approaches may have a superficial environmental view as well as supporting capitalism. In non-anthropocentric approaches, in which people are not at the center, the individual is held responsible for nature, but he is only one of the living beings in terms of value; environmentalist views can have progressive dimensions. (Thompson, 2000). According to these views, non-anthropocentric approaches and viewpoints directed towards the environment can be said to be more affirmative than anthropocentric approaches.

The most efficient way to develop people's positive viewpoints towards the environment, in other words, in forming awareness towards the environment, is to begin the environmental training at an early age (Basile, 2001; Wilson, 1996). Interestingly, perceptions of the children at early childhood level towards environment change depend on the neighborhood and socio-economical background and the term environment is shaped with children's own desire and imagination (Şahin, 2008). So, environmental education should be practiced at early levels. Many researchers are interested in people's awareness and attitudes towards the natural environment; Dunlap & Van Liere (1978) designed NEP (New Environmental Paradigm Scale to gauge people's opinion about the environment (La Trobe & Acott, 2000). This scale is used by many other researchers for the same purpose (Geller & Lasley, 1985; Arcury et al., 1986; Dunlap et al., 2000; Lalonde & Jackson, 2002; Manoli et al., 2007)

There are many researches in Turkey about environmental awareness and education. Çabuk & Karacaoğlu argue that "The influence of the individual's awareness and the environmental training he or she has taken on resolution of environmental problems can not be undervalued". In the same way, Şimşekli (2004) stresses that the most efficient solution related to environmental problems is to take necessary measures before the problem emerges, and the most crucial factor for this is education. Kocakurt & Güven (2005) suggest that the most efficient method of raising an environmentally conscious generation is to give a comprehensive environmental education to individuals. Atasoy & Yüksel (2006) mention that the function of environmental education increases by degrees since individuals who are environmentally conscious are needed to seeking out solutions to environmental problems. Uzun & Sağlam (2006) emphasize that the most efficacious way for the solution of environmental problems is the raising of consciousness

and awareness in individuals. In the research, it is stated that environmental education is the most influential method in forming positive attitudes, knowledge and standards of judgments for changing individual behaviors in relation to the environment, and in developing a model human who will notice that an environmental problem emerging in any place of the world affects the whole world (Erten, 2005; Ilgar, 2007). In research stressing that environmental education should be provided from an early age, it is emphasized that in Turkey, environmental education should be developed in preschool or primary school level systematically since families are not sufficiently conscious of the subject to be able to provide their children with environmental knowledge for training them (Şimşekli, 2004).

Individuals begin to take their environmental education in their families and continue this in formal education. It is emphasized that environmental education should be given to individuals at various levels of primary school, high school education and university education beginning in preschool science education owing to the interdisciplinary feature of environmental education in formal education. (Yılmaz et al., 2002).

Environmental education is not given to the students as a comprehensive lesson in preschool period, but rather on the basis of activities. It is given to the students most intensively in social science lesson in the first three years, and in the following years it is given more fully in science education lessons. The importance of primary school stage and science education lessons on developing affirmative viewpoints in people towards the environment makes the viewpoints of pre-service teachers who are educated to deliver this lesson also important (Karakaya, 2008).

The purpose of this research is to determine the viewpoints of primary school pre-service science teachers within the frame of anthropocentric and non-anthropocentric approaches. For this aim, current study tries to answer the following questions: “What are the viewpoints of primary education pre-service science teachers about the environment? and Are these viewpoints differentiated according to certain variants?” This research is significant in that it is the first research about such a subject in Turkey.

2. Method and findings

The study was conducted in quantitative research method and the survey method was used. In accordance with the purpose of study, a 5 point Likert scale called “The Viewpoint towards Environment” which was developed by researchers was applied as means of data collection (Köklü et al., 2007). In a university at the Black Sea Region of Turkey, primary school pre-service science teachers (N=321) at different levels formed the research sample. The analyses of data acquired were provided by using SPSS 13.0 package.

The scale applied in the research was developed through literature scanning by the researcher. Its reliability coefficient was determined as .85 (Cronbach α). 24 articles measuring demographic data and viewpoints towards environment were included in the scale. Related articles cover the themes such as population growth, industrialization, human being-nature relation and natural sources, and they interrogate the viewpoint towards the environment with anthropocentric and non-anthropocentric expressions. 5 point Likert scale includes the expressions of “I strongly agree, I agree, I am undecided, I disagree and I strongly disagree”. Values to clarify general averages were attained, and these values were gradated. According to this, pre-service teachers below the average value were accepted as individuals adopting anthropocentric viewpoints, and the ones over the average value were accepted as individuals adopting non-anthropocentric viewpoints. Gradations of each pre-service teacher’s general average values are tabulated below.

Table 1. Gradations of pre-service teacher’s general average values

General average values	1.00-1.49	1.50-2.49	2.50-3.49	3.50-4.49	4.50-5.00
Grade	1	2	3	4	5

2. 1. Findings related to the directions of primary education pre-service science teachers’ viewpoints according to the anthropocentric and non-anthropocentric approaches are presented in the chart below.

Table 2. Frequency of pre-service teachers' viewpoints according to their general average values

Average	Grade	Frequency	Percent %
1.00-1.49	1	0	0
1.50-2.49	2	1	0.3
2.50-3.49	3	46	14.3
3.50-4.49	4	233	72.6
4.50-5.00	5	41	12.8
Total	-	321	100.0

According to the table 2, it is realized that a large majority of the pre-service teachers have adopted non-anthropocentric views.

2. 2. Whether primary education science education pre-service teaches' viewpoints towards the environment show significant differences according to the assorted variants or not was determined through t-test and one-way ANOVA results, according to anthropocentric and non- anthropocentric approaches; and findings related to the variants are indicated sequentially below.

There is no significant difference in accordance with their gender. According to their grades, significant differences were found. The table which demonstrates pre-service teachers' viewpoints towards the environment according to their grades is below.

Table 3. The ANOVA scores of pre-service teachers' viewpoints according to their grades

	d. f.	Sum of Squares	Mean Square	F	Sig.
Between groups	3	7,612	2,537		
Within groups	317	60,961	,192	13,193	,00*
Total	320	68,572			

According to their grades, significant differences were found between first (M= 3,9494), second (M= 3,9885) and fourth (M= 4,0647) grade pre-service teachers and third (M= 3,6236) grade pre-service teachers ($p<0.05$). It was ascertained that first, second and fourth grade pre-service teachers' viewpoints towards the environment were closer to non- anthropocentric viewpoints when compared to third grades.

There is no significant difference in accordance with their being first or second education students, the places they live and their mothers' jobs. According to their fathers' jobs, significant differences were found. The table which demonstrates pre-service teachers' viewpoints towards the environment according to their fathers' jobs is below.

Table 4. The ANOVA scores of pre-service teachers' viewpoints according to their fathers' jobs

	d. f.	Sum of Squares	Mean Square	F	Sig.
Between groups	6	3,273	,546		
Within groups	299	63,585	,213	2,566	,019*
Total	305	66,859			

According to their fathers' occupation, significant differences were found between the fathers who are unemployed (M= 3,4954) and the fathers who have independent business (M= 4,0543). It was ascertained that environmental viewpoints of pre-service teachers whose fathers have independent business were closer to non-anthropocentric viewpoints when compared to environmental viewpoints of pre-service teachers whose fathers are unemployed.

There is no significant difference in accordance with levels of income and political views. According to the high schools they graduated from, significant differences were found. The table which demonstrates pre-service teachers' viewpoints towards the environment according to the high school they graduated from is below.

Table 5. The ANOVA scores of pre-service teachers' viewpoints according to the high schools they graduated from

	d. f.	Sum of Squares	Mean Square	F	Sig.
Between groups	5	4,436	,887		
Within groups	315	64,136	,204	4,357	,001*
Total	320	68,572			

According to the high schools they graduated from, significant differences were found between private high schools (M= 4,3333) and teacher mastership high schools (M= 3,7337). It was ascertained that environmental viewpoints of pre-service teachers who graduated from private high schools were closer to non-anthropocentric viewpoints when compared to environmental viewpoints of pre-service teachers who graduated from teacher mastership high schools.

3. Conclusion

In accordance with anthropocentric and non-anthropocentric approaches, it was ascertained that primary school pre-service science teachers' viewpoints towards the environment are predominantly non-anthropocentric. This means that approaches and behaviors towards the environment and nature are positive. Value judgments and attitudes which are constituted in childhood and young ages are effective in forming a love for nature, and in developing empathy for relationships with nature (De Haan, 1998; Erten, 2005). From this point of view, it can be said that pre-service teachers have positive environmental approaches and behaviors at early ages of their life.

According to anthropocentric and non-anthropocentric approaches, no significant difference was ascertained according to gender, education form, the regions in which pre-service teachers live, mothers' occupations, level of income and political viewpoints in findings related to whether primary school pre-service science teachers' viewpoints towards the environment indicate significant differences in respect of assorted variants.

According to their class levels it was ascertained that first, second and fourth grade pre-service teachers were closer to non-anthropocentric views when compared to third grade pre-service teachers. The reason for alienation from non-anthropocentric approaches which is realized generally after the first year as the level rises, can be related to the phase in which studentship is coming to an end, to attempts to adjust to a new life, to stress over finding an occupation; to an increase in depressive symptoms (Özdel et al., 2002); according to this approach, this is the period when they think of themselves more than anything. However, it can be seen from the conclusion of the research that process of alienation from positive perspectives ends after the third grade, and positive differences can be observed in the fourth grade when compared to the previous grade. It is thought that the reason behind this is the ecology and environmental sciences content course called "special topics in biology" which they received in this period.

According to fathers' occupations, it was ascertained that the viewpoints of pre-service teachers whose fathers were engaged in independent business were closer to non-anthropocentric viewpoints than the ones whose fathers were unemployed. In the study named as "Attitudes of Pre-service Teachers towards Environment" conducted in 2003 by Erdoğan Şama, it was ascertained that perspectives of prospective teachers whose fathers were engaged in independent business were more positive towards the environment than the ones whose fathers were farmers. Since the income level of the ones whose fathers are unemployed and farmers are comparatively higher than that of the ones whose fathers are engaged in independent business, this case can be bound to the result that financial anxiety negatively affects environmental attitudes and perspectives.

According to the kinds of high schools which prospective teachers graduated from, it was ascertained that perspectives of prospective teachers graduating from the private schools or colleges towards the environment were closer to the non-anthropocentric approaches when compared to the ones graduating from teachers' high schools.

That perspectives of pre-service teachers towards the environment are generally non-anthropocentric is a positive result. Courses which will enable them to convey these attitudes to their students and which will prioritize environmental education and teaching should be given to prospective teachers as part of their instructional program.

Education should be provided for maintaining and developing these positive attitudes of pre-service teachers. Related subjects should be reviewed both with courses in their school teaching education and with in-service trainings topics in their working periods. Then, instructional materials about science and environmental education are prepared within a educational perspectives and learning approaches.

By implementing the scale of this study, which was conducted in order to determine the perspectives of primary school prospective teachers towards the environment according to anthropocentric and non-anthropocentric perspectives, to other professions research can be conducted on whether there are differences in other proffessions in attitudes towards the environment or not. In order to determine the situation in formal education, a related scale can be applied to teachers rather than prospective teachers with its recent condition or by developing it, and the conclusions can be evaluated.

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